

A DESCRIPTION OF THE MALE AND FEMALE OF *CHORIOPTES CREWEI*
LAVOPIERRE 1958 (ACARINA : *PSOROPTIDAE*), TOGETHER WITH
SOME REMARKS ON THE FAMILY *PSOROPTIDAE* AND A KEY TO
THE GENERA CONTAINED IN THE FAMILY

BY

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The purpose of this paper is to provide a detailed and fully illustrated description of the male and the female of *Chorioptes crewei* Lavoipierre, a very brief account of which was published in the form of a preliminary note in 1958. In order to facilitate a comparison of *C. crewei* with *C. bovis*, this communication also includes figures of the male and of the female of *C. bovis* which have been prepared from material obtained from a cow in the Liverpool area. Unfortunately, specimens of the third species contained in the genus *Chorioptes*, *C. texanus*, were not available for comparison, but recourse was made to papers by HIRST (1924, 1952) and by SWEATMAN (1958) in which this species is fully discussed. In addition, this paper also comprises a short discussion of the family *Psoroptidae* and includes a key to the genera contained in the family.

Family PSOROPTIDAE.

Genus *Chorioptes*.

Chorioptes crewei Lavoipierre 1958.

FEMALE (fig. 1 and 3). Slightly larger than *C. bovis* which it resembles closely. Idiosoma oval in outline. Cuticle striated on the dorsal and ventral surfaces. Length (including gnathosoma) varying between 0.395 mm., and 0.436 mm.; width varying between 0.238 mm., and 0.263 mm. (5 specimens).

Dorsal surface (fig. 1). The propodosomal shield which bears fine punctations is elongated and bell-shaped in form. The arrangement of the dorsal setae is similar in both *C. crewei* and *C. bovis*, although a comparison of fig. 1 (*C. crewei*) and

fig. 2 (*C. bovis*) reveals slight differences in the number and arrangement of the opisthosomal setae.

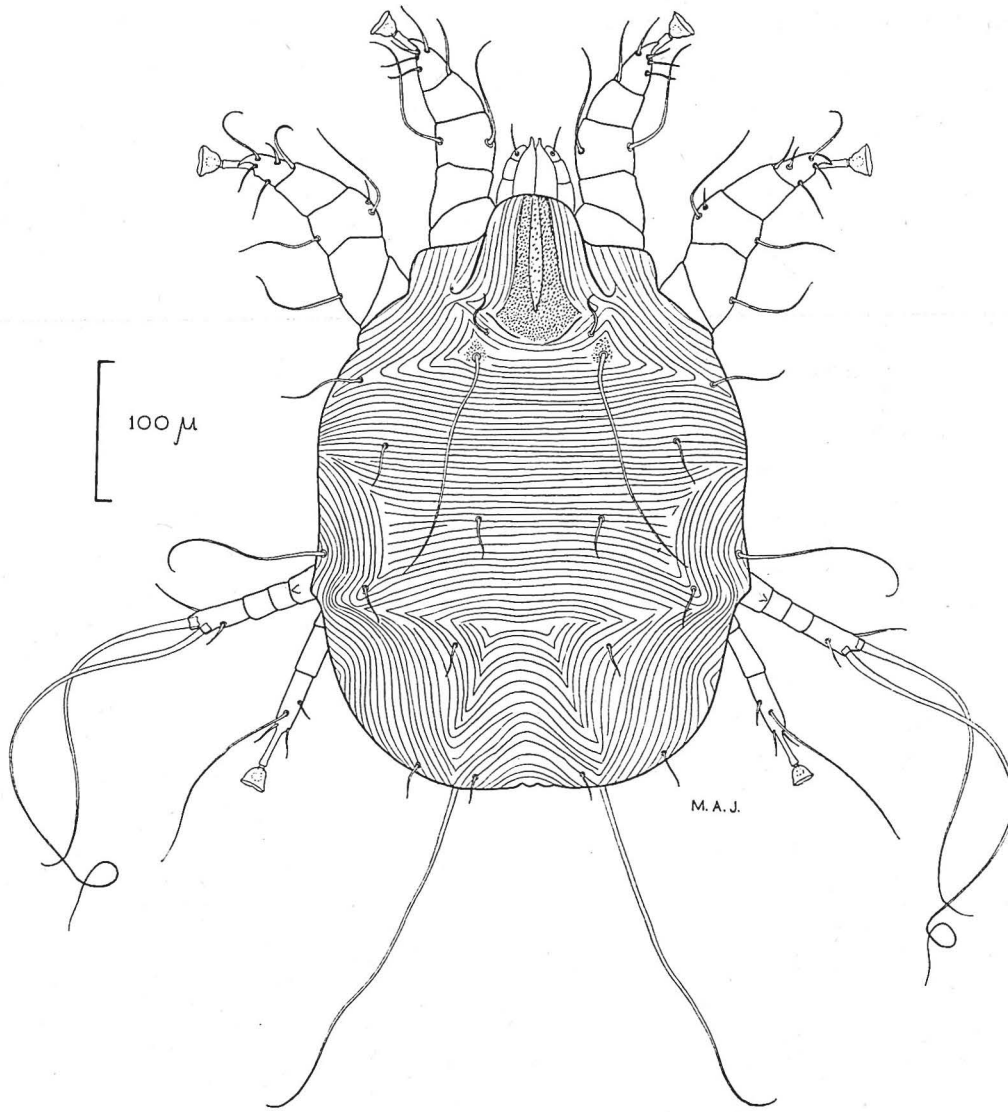


FIG. 1. — *Chorioptes creweyi*. Female, dorsal surface.

Ventral surface (fig. 3). Generally similar to that of *C. bovis* (compare fig. 3 and 4), although *C. creweyi* differs markedly from *C. bovis* in the morphology of the chitinous plates associated with the genital opening. As in the case of *C. bovis* and *C. texanus*, the epimera of leg I in *C. creweyi* do not join to form a sternum and legs I and II are stouter than leg III. The chaetotaxy of the legs of *C. creweyi*

are shown in fig. 1 and 3 ; a point which should be noted is that the long whip like seta on the dorsal surface of tarsus IV is relatively longer and more distinct in the case of *C. bovis* than in the case of *C. crewei* ; it is not absent as was erroneously stated in the original description.

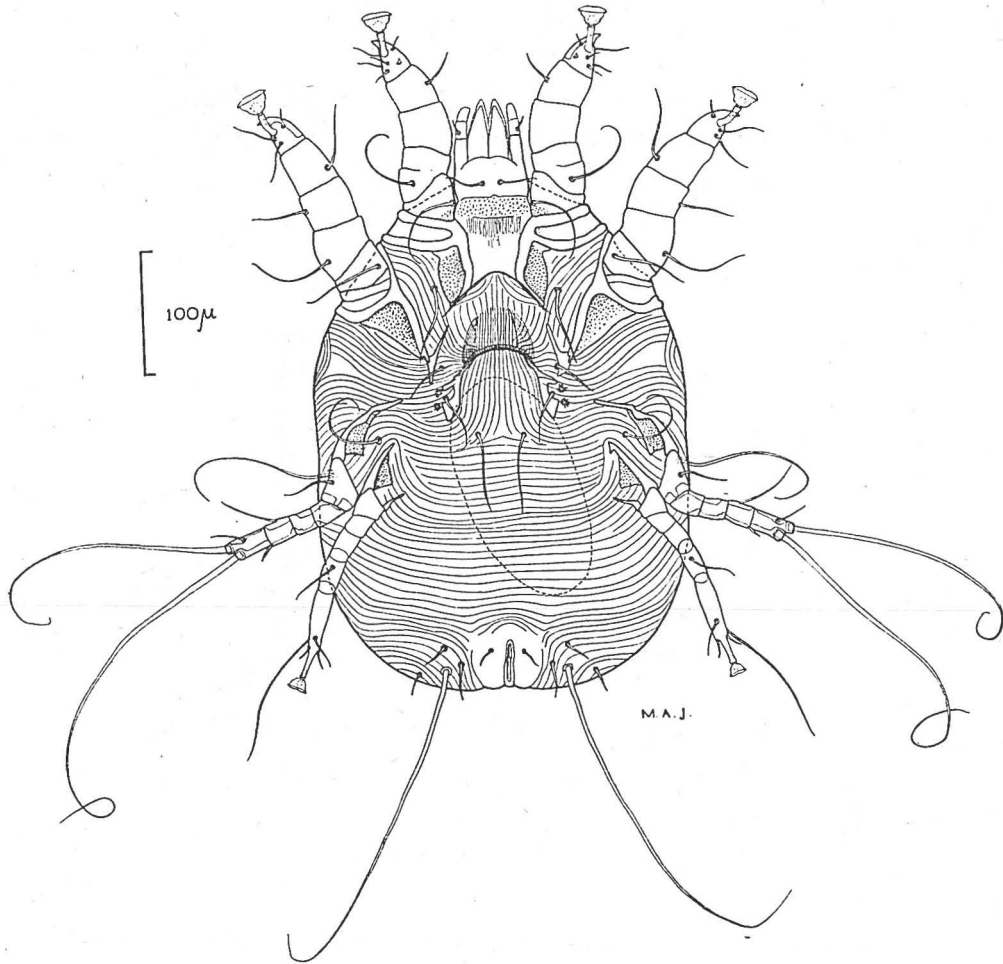


FIG. 3. — *Chorioptes crewei*. Female, ventral surface.

MALE (fig. 5 and 7). Smaller than the female. Strikingly different to that of the males of *C. bovis* (fig. 6 and 8) and *C. texanus*, not only in the shape of the body but also in the form of the abdominal lobes and the setae which they bear. Idiosoma in *C. crewei* oval in shape and not with the somewhat rectangular appearance of *C. bovis* and *C. texanus*. Length (from the tip of the gnathosoma to the indentation between the lobes) 0.288 mm. ; length (from the tip of the gnathosoma to the distal end of the lobes) 0.370 mm., and 0.374 mm. ; width (at the broadest point) 0.238 mm., and 0.230 mm. (2 specimens).

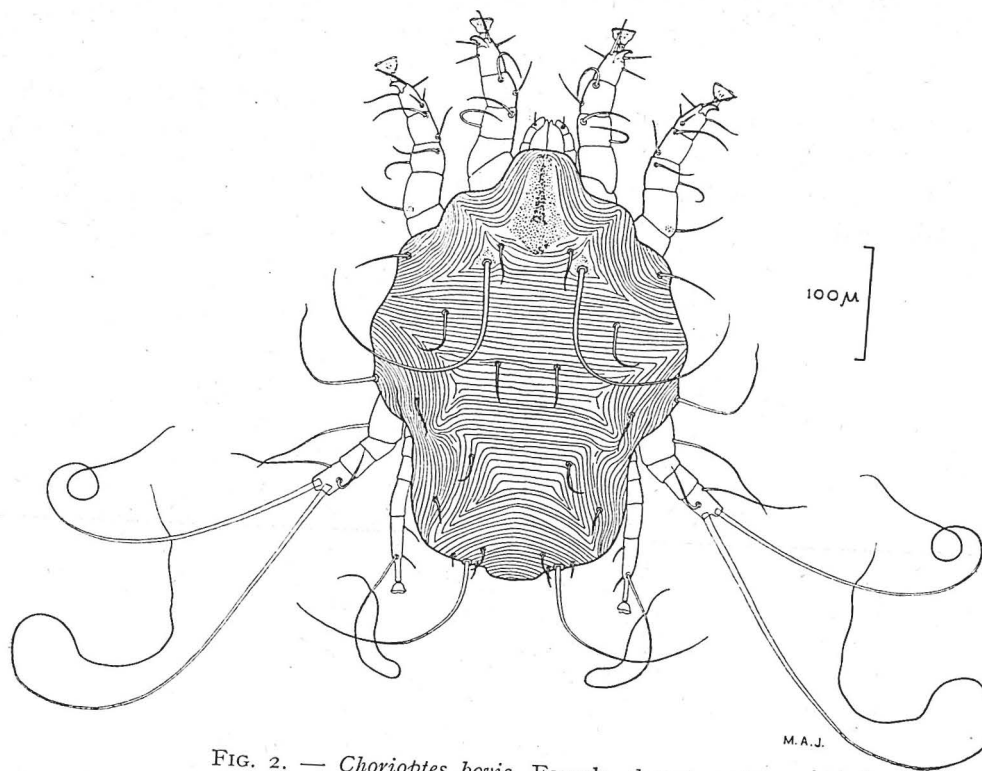


FIG. 2. — *Chorioptes bovis*. Female, dorsal surface.

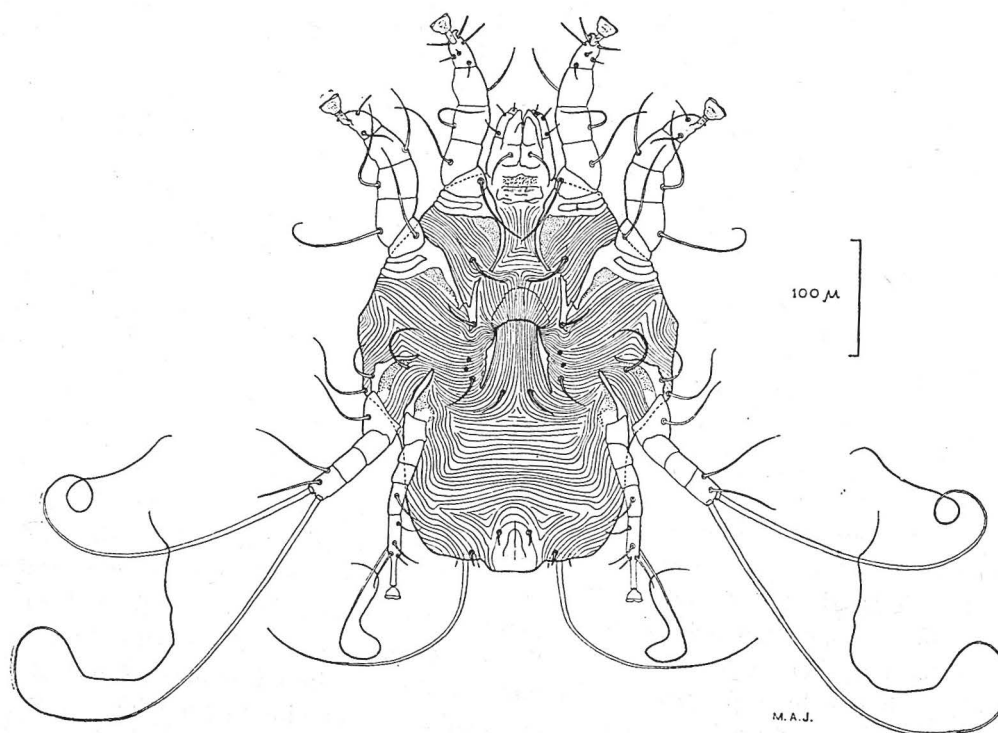


FIG. 4. — *Chorioptes bovis*. Female, ventral surface.

Dorsal surface (fig. 5). Propodosomal shield elongated and bell shaped with a central raised ridge. Opisthosomal shield somewhat pentagonal in form with two ill defined posterior "tongues" or extensions covering the dorsal surface of the abdominal lobes; setae on this shield less conspicuous than those of *C. bovis*.

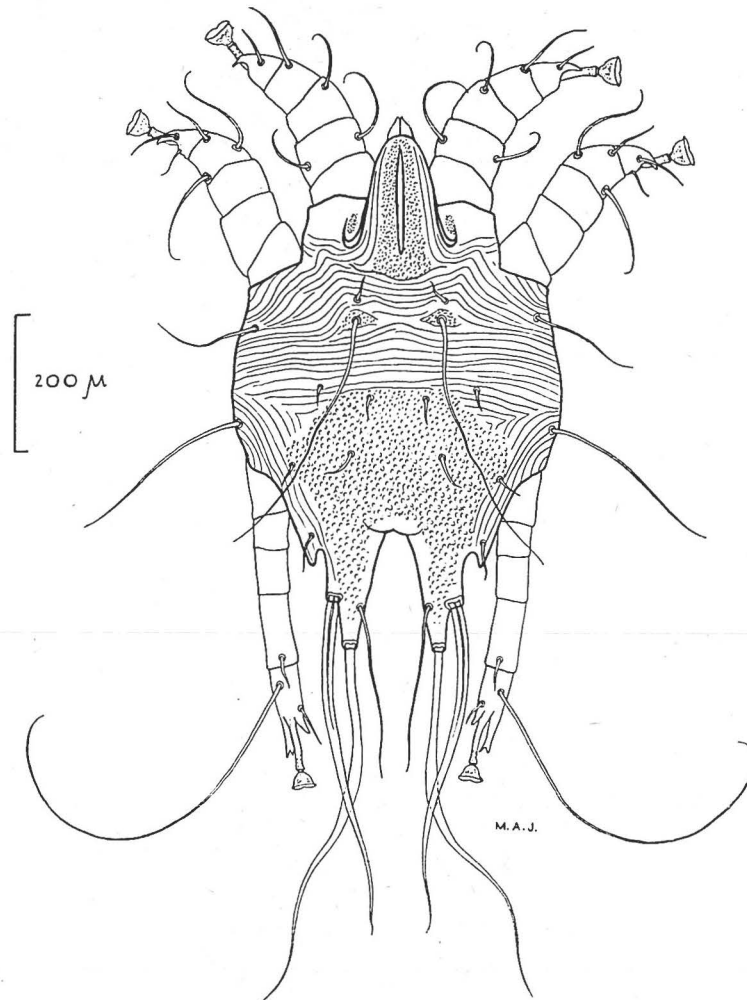


FIG. 5. — *Chorioptes creweii*. Male, dorsal surface.

The posterior abdominal lobes differ markedly from those of *C. bovis* and *C. texanus*. Whereas in *C. bovis* (fig. 6) and *C. texanus* each lobe is quadrangular in shape, in *C. creweii* it is triangular (see fig. 5). *C. creweii* has five setae on each lobe. The arrangement and morphology of the setae on each lobe is as follows: at the extreme tip of the lobe there arises a long, stout seta which is flattened halfway along its length, giving it the appearance of a blade of grass; at the midpoint of the medial edge of the lobe, and arising from a small "angle" are two long setae which appear

to unite a short distance from their origins to form a single blade-like seta ; in addition to these long setae the lobe bears two short setae, one of which (lying on the lateral edge) is ventral in position, while the other (lying on the medial edge) is dorsal in position.

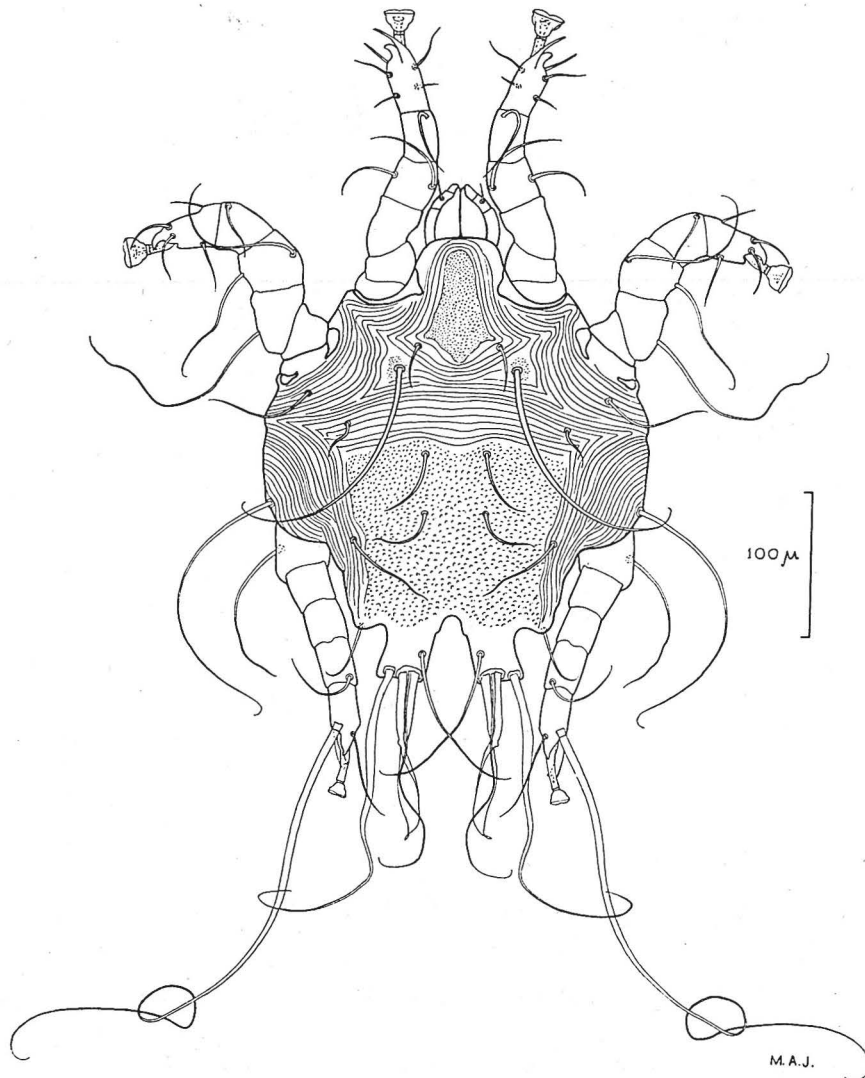


FIG. 6. — *Chorioptes bovis*. Male, dorsal surface.

Ventral surface (fig. 7). Coxae I and II, which are set close together, are well separated from Coxae III and IV which are contiguous. The genital organs lie at the level of Coxae III ; the penis is short and flanked by 2 pairs of minute hairs, each of which arises from little socket-like depressions. The two anal suckers, which are situated at the base of the abdominal lobes, are large and very distinct.

The epimera of leg I are unjoined but lie close to each other. Legs I and II are distinctly stouter than leg III; leg IV is short, being about a third of the length of leg III. Tarsi I and II each terminates in a claw and a short unsegmented

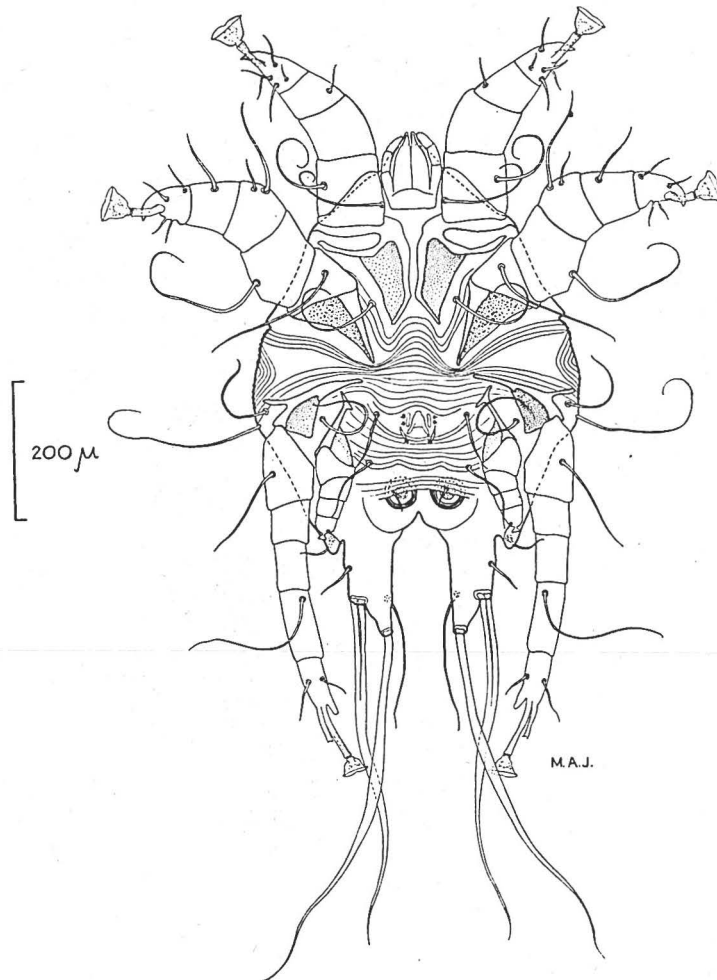


FIG. 7. — *Chorioptes creweii*. Male, ventral surface.

pedicel bearing a cup like sucker. Tarsus III also terminates in a claw and a pedicel bearing a sucker, but the pedicel is distinctly longer than those of tarsi I and II; in addition tarsus III also bears a rod like structure (somewhat similar to those of *C. bovis* and *C. texanus*), which is indented at its tip giving it an appearance of being jagged. As in *C. bovis* and *C. texanus* tarsus III of *C. creweii* bears on its dorsal surface a long whip-like seta which appears to be relatively shorter in *C. creweii* than in the other two species. In the material which we have at our disposal, it was found very difficult to determine the nature of the structures borne

at the tip of tarsus IV in the case of both *C. crewei* and *C. bovis*. We found it impossible to recognise a distinctly visible sucker in *C. bovis* as figured by Sweatman (1958) and we met with the same difficulty in the case of *C. crewei*; however,

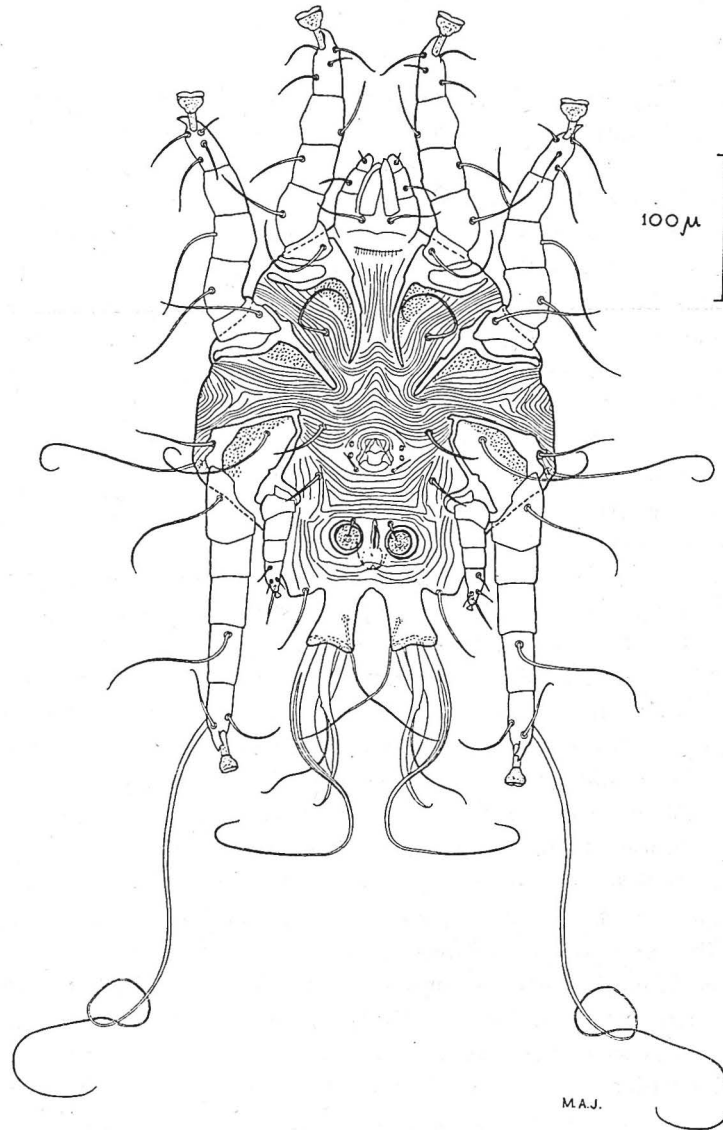


FIG. 8. — *Chorioptes bovis*. Male, ventral surface.

in both species, tarsus IV appears to terminate in at least one very small sucker; this sucker which could only be seen with difficulty using the oil immersion lens, is indicated in the figures.

The description and the figures of the male and the female of *Chorioptes crewei*

are based on four females and two males taken from the ear of a small antelope, *Cephalophus rufilatus* Gray (1846) at Bombe in the British Cameroons on the 30th May 1956. These six specimens form the type material from which the original description (LAVOPIERRE, 1958) was drawn up.

SOME REMARKS ON THE GENERA AND SPECIES OF ACARINA
BELONGING TO THE FAMILY PSOROPTIDAE.

The family *Psoroptidae* is regarded at the present time as being composed of the following four genera : *Chorioptes*, *Psoroptes*, *Otodectes* and *Caparinia*. Although psoroptid mites are of great clinical importance to the veterinarian, their systematics have long been neglected and only very few recent attempts at a revision have been undertaken. The only significant taxonomic papers which have been published on these acarines since the end of the Second World War, a period of thirteen years, are two excellent accounts of the genus *Chorioptes* by SWEATMAN (1957, 1958), and a finely illustrated paper by LAWRENCE (1955) describing a new species of *Caparinia* and including notes on the genus. A revision of the genus *Otodectes* and, in particular, of the genus *Psoroptes* on the lines of SWEATMAN'S work, is very urgently needed.

In the present paper the genus *Chorioptes* is regarded as being composed of only three species : *C. bovis* Hering 1845, *C. texanus* Hirst 1924 and *C. crewei* Lavoipierre 1958. This view accords with that of SWEATMAN (1957, 1958) who studied not only the morphology of a large series of *Chorioptes* taken from various hosts but also their host relations. He was unable to demonstrate any difference between chorioptic mites taken from cows, horses, goats, sheep and llamas and he showed moreover that they were transferable from one host to another. In this laboratory Miss M. A. JOHNSON (M. A. J.) and I have recently been able to compare very carefully chorioptic mite material taken from cattle, sheep, goats, horses, and the asiatic buffalo, and we are able to confirm SWEATMAN'S conclusions that there do not appear to be any recognisable morphological distinctions existing between the forms from the various hosts.

Although no biological studies comparable to those of SWEATMAN on *Chorioptes* have been carried out on the genus *Psoroptes*, Hirst (as early as 1921) regarded the genus *Psoroptes* as being composed of two species : *P. natalensis*, and *P. communis* a species which he regarded as including, as varieties, all the other known forms of *Psoroptes* (CANESTRINI and KRAMER, 1899 ; HIRST 1921). It is doubtful, however, if even *P. natalensis* can be regarded as a " good " species and its status should be re-examined in the light of comparative study.

Whilst it seems likely that a study of otodectic material will lead to the conclusion that *Otodectes* is a monotypic genus, since as early as 1899 CANESTRINI and KRAMER found it impossible to indicate characters by which the two species known to them could be separated, the position as regards the remaining genus

of the family *Psoroptidae* — the genus *Caparinia* — is quite different. LAWRENCE (1955), who has recently published an excellent and very well illustrated description of *Caparinia ictonyctis* Lawr., has reviewed our knowledge of the genus *Caparinia* and has recognised the forms as valid species. It is thus clear that the genus *Caparinia* must be regarded as a polytypic genus containing four "good" species.

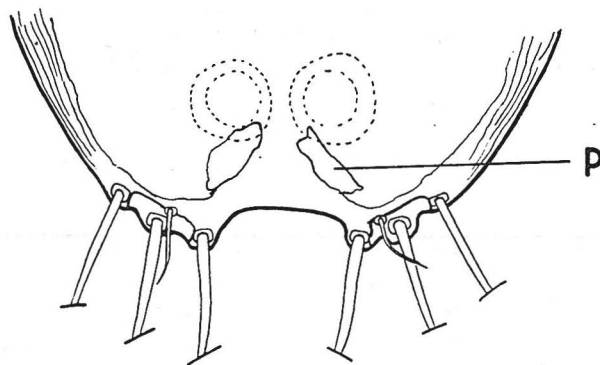


FIG. 9. — *Octodectes cynotis*. Male, posterior dorsal portion of the body.
P. — one of the dorsal jagged chitinous processes overlying an anal sucker.

As a result of the present study which entailed an examination of extensive psoroptid material in the collections of the Liverpool School of Tropical Medicine, the following key to the genera of the *Psoroptidae* has been devised.

KEY TO THE GENERA CONTAINED IN THE FAMILY PSOROPTIDAE.

Females.

1. — Legs I, II and IV ending in a pedicel and sucker ; Leg III ending in long setae. 2
 — Legs I and II ending in a pedicel and sucker ; legs III and IV ending in long
 setae. 3
2. — Pedicel of suckers segmented and long. *Psoroptes*.
 — Pedicel of suckers non-segmented and short. *Chorioptes*.
3. — Tarsus III with 2 long setae. *Otodectes*.
 — Tarsus III with 3 long setae. *Caparinia*

Males.

1. — Pedicels of suckers long and segmented. *Psoroptes*
 — Pedicels of suckers short and unsegmented. 2
2. — Abdominal lobes very poorly developed ; two strong jagged chitinous processes
 on dorsal surface overlying anal suckers (see fig. 9). *Otodectes*.
 — Abdominal lobes distinct ; no such chitinous processes. 3
3. — Tarsus III with only one long seta. *Chorioptes*.
 — Tarsus III with more than one long seta. *Caparinia*.

SUMMARY

1. — The male and the female of *Chorioptes crewei* Lavoipierre 1958 are described and figured. Figures are given of the male and the female of *Chorioptes bovis* Hering 1845.
2. — The genus *Chorioptes* is regarded as being composed of three valid species : *C. bovis* Hering 1845, *C. texanus* Hirst 1924 and *C. crewei* Lavoipierre 1958.
3. — The genera *Psoroptes*, *Otodectes* and *Caparinia* are briefly discussed.

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